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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/827,566
Filing Date: April 19, 2004
Appellant(s): BATRA ET AL.

Michael F. Hoffman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 23, 2009 appealing from the Office action mailed February 3, 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO 02/39486	Farmer	5-2002
6,909,974 B2	Yung et al.	6-2005

(9) Grounds of Rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8-14, 16-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Farmer (WO 02/39486)

As per claim 1, Farmer teaches "A system for dynamically implementing a chain of Web services from a client on the World Wide Web to execute a workflow for analyzing microarray data," (see Abstract and paragraph 0008)

"comprising: a database for storing a list of available Web services, wherein each listed Web service includes a description of a task performed by the Web service and an input signature and an output signature of the Web service, wherein the Web service comprises a computer program accessible over the World Wide Web;" (Figure 3, paragraphs 0018, 0022, 0022, 0051, 0057, 0058, 0062, wherein a Service Broker accepts requests and provides connections to services, and contains service names, types, and attributes in Java class format, including type signatures)

"and a selecting system for forming the chain of Web services by selecting a Web service from the list of available Web services for each of a plurality of tasks in the workflow," (Figure 11, paragraphs 0040, 0053, 0060, 0061, 0062, 0063, wherein services can be linked together and service attributes and classes are used for interaction)

"wherein the workflow comprises a series of linked tasks and a specified input and output format," (Figure 3, paragraphs 0040, 0042, 0043, 0045, 0046, 0053, 0062, wherein services interact and identify with each other through java classes, and are encapsulated to interact with each other, including formats defined by type signatures)

"and wherein the selecting examines a set of available Web services configured to execute completing each task and identifies and selects at least one Web service having matching input and output signatures ensuring that each Web service selected to complete a task is compatible with adjacent Web services in the chain of Web services" (Figure 3, Figure 11, paragraphs 0022, 0036, 0041, 0043, 0046, 0048, 0049, 0056, 0057, 0058, 0061, 0070, 0071, 0074-0079, wherein services are provided by

service providers, and a client can utilize dynamic discovery to identify services that can recognize the data type to complete the service, to integrate heterogeneous data components and services).

"and a signature matching system for identifying the set of available web services configured to execute each task, wherein for each task the identifying comprises identifying all Web services in the list of available Web services having at least one of the matching input and output signatures for each task." (paragraphs 0018, 0021, 0041, 0042, 0043, 0044, 0045, 0046, 0048, 0051, 0058, 0059, 0060, 0061, wherein registered services and events are utilized to address user queries by service identifiers, and service types and input/output are identified to link service executions)

As per claim 2, Farmer teaches "the workflow comprises a microarray analysis workflow." (Figure 2, paragraphs 0049, 0086)

As per claim 3, Farmer teaches "a workflow generator for creating the workflow." (paragraphs 0049, 0050)

As per claim 4, Farmer teaches "the list of available Web services resides locally with the client." (paragraphs 0039, 0044)

As per claim 5, Farmer teaches "a system for collecting and storing available Web services data." (paragraphs 0018, 0022)

As per claim 6, Farmer teaches "a system for inputting sequence data into the workflow execution." (paragraph 0067)

As per claim 8, Farmer teaches "A program product, stored on a recordable medium for executing a workflow by dynamically implementing Web services from a client on the World Wide Web for analyzing microarray data," (see Abstract and paragraph 0008)

"comprising: program code configured for storing a list of available Web services, wherein each listed Web service includes a description of a task performed by the Web service, and an input signature and an output signature of the Web service;" (Figure 3, paragraphs 0018, 0022, 0022, 0051, 0057, 0058, 0062, wherein a Service Broker accepts requests and provides connections to services, and contains service names, types, and attributes in Java class format, including type signatures)

"and program code configured for forming a chain of Web services by selecting a Web service from the list of available Web services for each of a plurality of tasks in the workflow," (Figure 11, paragraphs 0040, 0053, 0060, 0061, 0062, 0063, wherein services can be linked together and service attributes and classes are used for interaction)

"wherein the workflow comprises a series of linked tasks and a specified input and output format," (Figure 3, paragraphs 0040, 0042, 0043, 0045, 0046, 0053, 0062, wherein services interact and identify with each other through java classes, and are encapsulated to interact with each other, including formats defined by type signatures)

"and wherein the selecting examines a set of available Web services configured to execute completing each task and identifies and selects at least one Web service having matching input and output signatures ensuring that each Web service selected

to complete a task is compatible with adjacent Web services in the chain of Web services" (Figure 3, Figure 11, paragraphs 0022, 0036, 0041, 0043, 0046, 0048, 0049, 0056, 0057, 0058, 0061, 0070, 0071, 0074-0079, wherein services are provided by service providers, and a client can utilize dynamic discovery to identify services that can recognize the data type to complete the service, to integrate heterogeneous data components and services).

"program code configured for identifying the set of available web services configured to execute each task, wherein for each task the identifying comprises identifying all Web services in the list of available Web services having at least one of the matching input and output signatures for each task." (paragraphs 0018, 0021, 0041, 0042, 0043, 0044, 0045, 0046, 0048, 0051, 0058, 0059, 0060, 0061, wherein registered services and events are utilized to address user queries by service identifiers, and service types and input/output are identified to link service executions)

As per claim 9, Farmer teaches "the workflow comprises a microarray analysis workflow." (Figure 2, paragraphs 0049, 0086)

As per claim 10, Farmer teaches "the workflow comprises a bioinformatics workflow." (paragraphs 0008)

As per claim 11, Farmer teaches "means for creating the workflow." (paragraphs 0049, 0050)

As per claim 12, Farmer teaches "the storage means resides locally with the client." (paragraphs 0039, 0044)

As per claim 13, Farmer teaches "means for collecting and storing available Web services data in said storage means." (paragraphs 0018, 0022)

As per claim 14, Farmer teaches "a system for inputting sequence data into the workflow execution." (paragraph 0067)

As per claim 16, Farmer teaches "A method for executing a bioinformatics workflow from a client on the World Wide Web," (see Abstract and paragraph 0008)

"comprising: providing a workflow having a plurality of linked tasks and a specified input and output format;" (Figure 3, paragraphs 0040, 0042, 0043, 0045, 0046, 0053, 0062, wherein services interact and identify with each other through java classes, and are encapsulated to interact with each other, including formats defined by type signatures)

"providing a list of known bioinformatics Web services, wherein each listed Web service includes a description of a task performed by the Web service, and an input signature and an output signature of the Web service, further wherein the Web service comprises a computer program accessible over the World Wide Web;" (Figure 3, paragraphs 0018, 0022, 0022, 0051, 0057, 0058, 0062, wherein a Service Broker accepts requests and provides connections to services, and contains service names, types, and attributes in Java class format, including type signatures)

"selecting a Web service from the list of known bioinformatics Web services for each task in the bioinformatics workflow to form a chain of Web services, wherein the selecting step examines a set of available Web services configured to execute each

task and identifies and selects at least one Web service having matching input and output signatures ensuring that each Web service selected to complete a task is compatible with adjacent Web services in the chain of Web services" (Figure 3, Figure 11, paragraphs 0022, 0036, 0041, 0043, 0046, 0048, 0049, 0056, 0057, 0058, 0061, 0070, 0071, 0074-0079, wherein services are provided by service providers, and a client can utilize dynamic discovery to identify services that can recognize the data type to complete the service, to integrate heterogeneous data components and services).

"identifying the set of available web services configured to execute each task, wherein for each task the identifying comprises identifying all Web services in the list of available Web services having at least one of the matching input and output signatures for each task." (paragraphs 0018, 0021, 0041, 0042, 0043, 0044, 0045, 0046, 0048, 0051, 0058, 0059, 0060, 0061, wherein registered services and events are utilized to address user queries by service identifiers, and service types and input/output are identified to link service executions)

"and calling each selected Web service in the chain to execute the bioinformatics workflow." (Figure 11, paragraphs 0040, 0053, 0060, 0061, 0062, 0063, wherein services can be linked together and service attributes and classes are used for interaction)

As per claim 17, Farmer teaches "the bioinformatics workflow comprises a microarray analysis." (Figure 2, paragraphs 0049, 0086)

As per claim 18, Farmer teaches "the list of known bioinformatics Web services resides locally to the client." ()(paragraphs 0039, 0044)

As per claim 20, Farmer teaches "the step of calling each selected Web service includes the step of providing a set bioinformatics data to a first Web service in the chain in the specified input format." (paragraph 0067)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7, 15, and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Farmer (WO 02/39486) in view of Yung et al. (US Patent 6,909,974 B2)

As per claim 7, Farmer is disclosed as per claim 1 above. Farmer does not teach "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data."

Yung teaches "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data." (Figure 10, 12A, 12B, 13, column 12 line 20 – column 13 line 2, column 19 line 60 – column 20 line 12, wherein XML format is used to

wrap information and provide communication between heterogeneous services in a bioinformatics system, particularly XML input and output files).

It would have been obvious to one of ordinary skill in the art to combine Farmer's method of allowing interoperation of heterogeneous bioinformatics software services with Yung's ability to utilize XML formatted files in communicating between different services linked in a workflow. This gives the user the ability to use XML when inputting and outputting bioinformatics data in a workflow to provide the user of a bioinformatics system a commonly used communication format, XML, and allows the user to define the tags that identify attributes. The motivation for doing so would be to provide a centralized biological information flow management system that requires less human involvement and the possibility of error than previous systems (column 1 lines 44-63)

As per claim 15, Farmer is disclosed as per claim 1 above. Farmer does not teach "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data."

Yung teaches "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data." (Figure 10, 12A, 12B, 13, column 12 line 20 – column 13 line 2, column 19 line 60 – column 20 line 12, wherein XML format is used to wrap information and provide communication between heterogeneous services in a bioinformatics system, particularly XML input and output files).

It would have been obvious to one of ordinary skill in the art to combine Farmer's method of allowing interoperation of heterogeneous bioinformatics software services with Yung's ability to utilize XML formatted files in communicating between different services linked in a workflow. This gives the user the ability to use XML when inputting and outputting bioinformatics data in a workflow to provide the user of a bioinformatics system a commonly used communication format, XML, and allows the user to define the tags that identify attributes. The motivation for doing so would be to provide a centralized biological information flow management system that requires less human involvement and the possibility of error than previous systems (column 1 lines 44-63)

As per claim 19, Farmer is disclosed as per claim 1 above. Farmer does not teach "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data."

Yung teaches "the input signature comprises a FASTA XML format for a set of input sequences and the output signature comprises an XML file format for providing spatial microarray placement data." (Figure 10, 12A, 12B, 13, column 12 line 20 – column 13 line 2, column 19 line 60 – column 20 line 12, wherein XML format is used to wrap information and provide communication between heterogeneous services in a bioinformatics system, particularly XML input and output files).

It would have been obvious to one of ordinary skill in the art to combine Farmer's method of allowing interoperation of heterogeneous bioinformatics software services

with Yung's ability to utilize XML formatted files in communicating between different services linked in a workflow. This gives the user the ability to use XML when inputting and outputting bioinformatics data in a workflow to provide the user of a bioinformatics system a commonly used communication format, XML, and allows the user to define the tags that identify attributes. The motivation for doing so would be to provide a centralized biological information flow management system that requires less human involvement and the possibility of error than previous systems (column 1 lines 44-63).

Response to Arguments

Applicant's arguments, see page 8, filed 11/13/2008, with respect to the 35 USC 112, second paragraph rejection of claims 1, 8, and 16 have been fully considered and are persuasive. The 35 USC 112, second paragraph rejection of claims 1, 8, and 16 has been withdrawn.

Applicant's arguments, see page 9, filed 11/13/2008, with respect to the 35 USC 101 rejection of claims 1-20 have been fully considered and are persuasive. The 35 USC 101 rejection of claims 1-20 has been withdrawn.

Applicant's arguments, see page 9, filed 11/13/2008, with respect to the rejection of claims 1-20 under 35 USC 102(b) have been fully considered but they are not persuasive. Details are stated below.

a. Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. See MPEP 2111 [R-I]

Interpretation of Claims-Broadest Reasonable Interpretation

During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.' Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

b. Applicant's argument is stated as Farmer does not teach "a signature matching system for identifying the set of available web services configured to execute each task, wherein for each task the identifying comprises identifying all Web services in the list of available Web services having at least one of the matching input and output signatures for each task."

In regards to the argument, the Examiner respectfully disagrees. As disclosed in paragraphs 0018 and 0021, Farmer discloses a Services Broker that provides services based on service name, types, or attributes. As disclosed above, the attributes of a service also disclose the input and output of the service, and can then be utilized to link services together for particular types of events and responds to them accordingly. The ability to identify available services to execute a workflow of tasks is further disclosed in paragraphs 0041, 0042, 0043, 0044, 0045, 0046, 0048, 0051, 0058, 0059, 0060, 0061, wherein registered services and events are utilized to address user queries by service identifiers, and service types and input/output are identified to link service executions. A registry of not only services, but also service names, types, and

attributes is utilized for executing particular data objects in a bioinformatics system. Therefore, Farmer teaches a signature matching system for identifying the set of available web services configured to execute each task, wherein for each task the identifying comprises identifying all Web services in the list of available Web services having at least one of the matching input and output signatures for each task.

c. Applicant's argument is stated as Farmer does not disclose identifying a set of available web services and selecting a web service from the list of available Web services for each of a plurality of tasks in the workflow.

In regards to this argument, Examiner respectfully disagrees. As stated in the above 102(b) rejection and the previous argument (filed 9/24/2008), Farmer discloses that services are provided by service providers (paragraph 0046) and a client can utilize dynamic discovery to identify services that can recognize the data type to complete the service (paragraphs 0048, 0049), for the integration of heterogeneous data components and services in a chain of services. As stated in paragraphs 0041, 0043, and 0044, Farmer teaches that a registry contains service information such as service names, types, and attributes, as well as the provider of specific services. As disclosed above and in the previous argument, the mapping of data and attributes of services is utilized to pass data through a linked series of services compatible with each other (paragraphs 0057, 0058, 0059 and specific example outlined in Figure 11 and paragraphs 0070, 0071, 0074-0079). The registry is utilized to listen for evens and register components

link to a particular service, so that future calls for a specific service can be addressed utilizing the registry, as shown in the example presented in paragraph 0044. Paragraph 0071 of Farmer more specifically discloses how services are registered and can then be invoked by utilizing a simple Java class that can be called in the integrated system. Therefore, Farmer teaches identifying a set of available web services and selecting a web service from the list of available Web services for each of a plurality of tasks in the workflow.

(10) Response to Argument

With respect to the outstanding 35 U.S.C. 102(b) rejections relating to claims 1-6, 8-14, 16-18, and 20, Applicants argue that Farmer (WO 02/39486) does not teach "a database for storing a list of available Web services, wherein each listed Web service includes a description of a task performed by the Web service and an input signature and an output signature of the Web service, wherein the Web service comprises computer program accessible over the World Wide Web" because Farmer's "service broker" does not contain a list of available Web services. It is respectfully submitted that Farmer discloses the limitation. In particular, Farmer, in paragraphs 0040 and 0041 teaches that a registry of components of a particular services is provided and stored in a client bus. As further disclosed in paragraphs 0050 and 0051, the interface that contains the list of available Web services is the ServiceProvider, which registers and provides services, as well as information and attributes regarding the Web services utilized when

operating several services found on the Internet. The paragraph of 0050 specifically discloses that Client and ServiceProvider interfaces are implemented in the system, to register and provide services found on the Internet (paragraph 0052). As is commonly understood in the art, a registry is a data store containing configuration and operation information. As the ServiceProvider contains a registry of services that may be located remotely on the Internet, the ServiceProvider contains a listing of services to be utilized in the system, as well as information such as names, types, and attributes of services tracked in the registry. Once a service is registered, the service objects are given references that may be called in response to a query, and can be linked to other services, provided the components are synchronized. A specific example is disclosed in paragraph 0061 and 0071, wherein the service provider is utilized with a simple java class to pass information between services in response to a query. The services are synchronized based on attribute and parameter information defined in the class. As pointed out by the Applicant's representative in page 6 of the Appeal Brief, a broker is an intermediary that requests and provides services, but it also contains a registry of service components and attributes, as disclosed above. Therefore, Farmer teaches a database for storing a list of available Web services, wherein each listed Web service includes a description of a task performed by the Web service and an input signature and an output signature of the Web service, wherein the Web service comprises computer program accessible over the World Wide Web.

As to the argument that Farmer does not teach "a selecting system for forming the chain of Web services by selecting a Web service from the list of available Web services for each of a plurality of tasks in the workflow", Examiner respectfully disagrees. Farmer is directed towards a system to utilize services that may be provided from remote sources on the Internet in a synchronized manner. Particularly, the abstract of Farmer states:

> "A system for the integration of heterogeneous bioinformatics software tools and databases that allows interoperation of components adhering to a minimal set of standards. The system includes a software platform, one or more interface-based data models, and one or more component services."

As interpreted by the Examiner, Farmer teaches a system to link various different applications and services through a common user interface. As disclosed above, a ServiceProvider stores a registry of services accessible to a client, the services may be found on the Internet. The way to link the various different services together is by utilizing the ServiceProvider information and utilizing a java interface to define classes and pass messages between services that are synchronized (paragraphs 0060, 0061, 0062, 0063). A specific example is discloses in Figure 11 and paragraphs 0073-0079 of Farmer, wherein data models from various services are linked together and mapped, and can communicate with each other once they are mapped through the java interface disclosed above. In particular, it is disclosed how four disparate data models from the different services can be linked and integrated together to be synchronized, and in response to a query, the mapping is utilized so that the services can operate together in a workflow. The query is launched by a SimilaritySearcher which allows the user to select specific services of interest to a user (paragraphs 0067, 0068, 0069, 0070) and

present relevant query results to a user by utilizing services selected to form a path through the services. The system of Farmer provides the user with the ability to filter search results based on selectable services to provide new capabilities and perspectives on biological data. Therefore, Farmer teaches a selecting system for forming the chain of Web services by selecting a Web service from the list of available Web services for each of a plurality of tasks in the workflow.

As to the argument that Farmer does not teach "and wherein the selecting examines a set of available Web services configured to execute completing each task and identifies and selects at least one Web service having matching input and output signatures ensuring that each Web service selected to complete a task is compatible with adjacent Web services in the chain of Web services", the Examiner respectfully disagrees. Farmer discloses utilizing Java classes to wrap messages passed between Web services. In particular, Farmer allows communication between services utilizing different data models through a simple java class for communication. As stated above, communication is directed through the ServiceProvider, acting as a service broker, (paragraphs 0042, 0043, 0045) allowing components of services to interact. In particular, Farmer supports Dynamic Discovery, wherein registered services can examine data objects from other services and determine whether it has the ability to process the data objects (paragraph 0048). Communication between services is accomplished by finding commonality between different data models and linking them together for synchronization, as disclosed in paragraphs 0056, 0057, 0058, 0059, and

0060, with simple java classes used to pass data objects between service components. In particular, the specification of the instant application defines signatures of services as specific bioinformatics input and output information utilized by services, which in the cited portions of Farmer, the classes are disclosed to be attributes of biological objects utilized in bioinformatics services. As disclosed in paragraphs 0018 and 0021, Farmer discloses a Services Broker that provides services based on service name, types, or attributes. As disclosed above, the attributes of a service also disclose the input and output of the service, and can then be utilized to link services together for particular types of events and responds to them accordingly. The ability to identify available services to execute a workflow of tasks is further disclosed in paragraphs 0041, 0042, 0043, 0044, 0045, 0046, 0048, 0051, 0058, 0059, 0060, 0061, wherein registered services and events are utilized to address user queries by service identifiers, and service types and input/output are identified to link service executions. As stated above, Figure 11 and paragraphs 0073-85 show a specific example of how services containing four separate high-level data models are linked together to disclose relationships, that can be utilized in response to a query. In particular, how the inputs and outputs of various services containing different high-level data models are linked together and work in synchronicity, based on mapped relationship information between services and attributes. The specific service components of Farmer's system can further dynamically determine if it can be related to different other service components by listeners that track events it can utilize. Therefore, Farmer teaches wherein the selecting examines a set of available Web services configured to execute completing each task and identifies

and selects at least one Web service having matching input and output signatures ensuring that each Web service selected to complete a task is compatible with adjacent Web services in the chain of Web services.

With respect to the outstanding 35 U.S.C. 103(a) rejections relating to claims 7, 15, and 19, the Applicant's representative presents arguments under similar grounds to the rejection of claims 1-6, 8-14, 16-18, and 20 above, and the response to the arguments for the rejection of claims 1-6, 8-14, 16-18 and 20 presented by the Examiner above is maintained.

Conclusion:

It is respectfully submitted that a combination of the references cited discloses the claimed database that stores a list of available Web services, including a description of a task to be performed by the Web service and an input signature and output signature, as well as a selecting system for forming a chain of Web services comprising a series of linked tasks and specified matching input and output formats. In light of the forgoing arguments, the examiner respectfully requests the honorable board of Appeals and Interferences to sustain the rejection.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,

/Dangelino Gortayo/

Dangelino Gortayo, Assistant Examiner, AU 2168

July 9, 2009

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